Clinical Data Mining Quickly Identifies Patient Risks Worldwide

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Learning Objectives

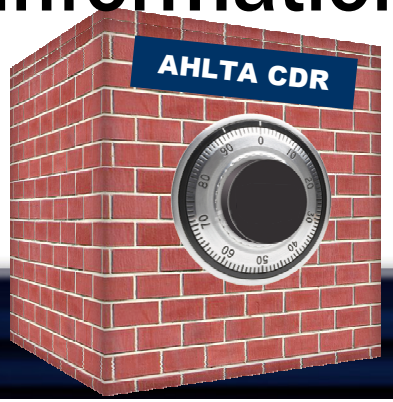
- Demonstrate the Clinical Data Mart's reporting capabilities
- Recognize the dangers of undiagnosed chronic disease
- See how automated clinical reporting can improve awareness of undiagnosed chronic disease

Clinical Data Mart (CDM)

- Serves as the clinical reporting tool for AHLTA, the Military Health System's electronic health record
- Measures, analyzes and manages direct patient care, wellness, prevention, and disease prevention
- Reports AHLTA demographic, symptomatic and diagnostic data

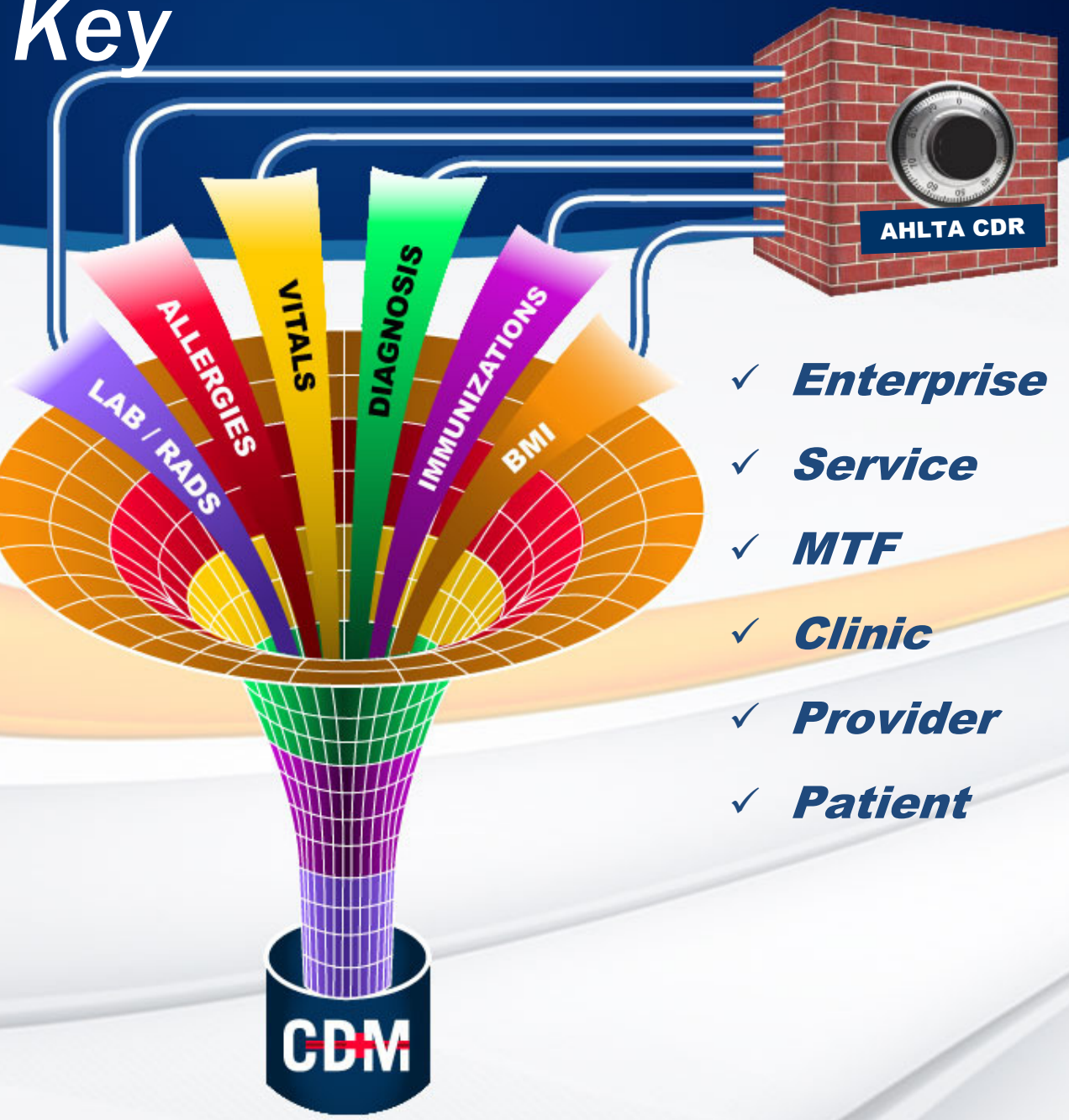
Unlocking Clinical Data

- Critical need for data captured in AHLTA
  - To improve quality, safety, and efficiency of care
  - To perform outcomes analysis and informed decisions
  - Measures, analyzes and manages direct patient care, wellness, prevention, and disease prevention
- CDM is key to turning data into information



CDM is the Key

- ✓ *Enterprise-wide Data*
- ✓ *Clinical Data Repository (CDR) Data Feed*
- ✓ *Scalable*
- ✓ *Market Leading Business Intelligence Toolset*
- ✓ *Robust Security*



- ✓ *Enterprise*
- ✓ *Service*
- ✓ *MTF*
- ✓ *Clinic*
- ✓ *Provider*
- ✓ *Patient*

CDM Users

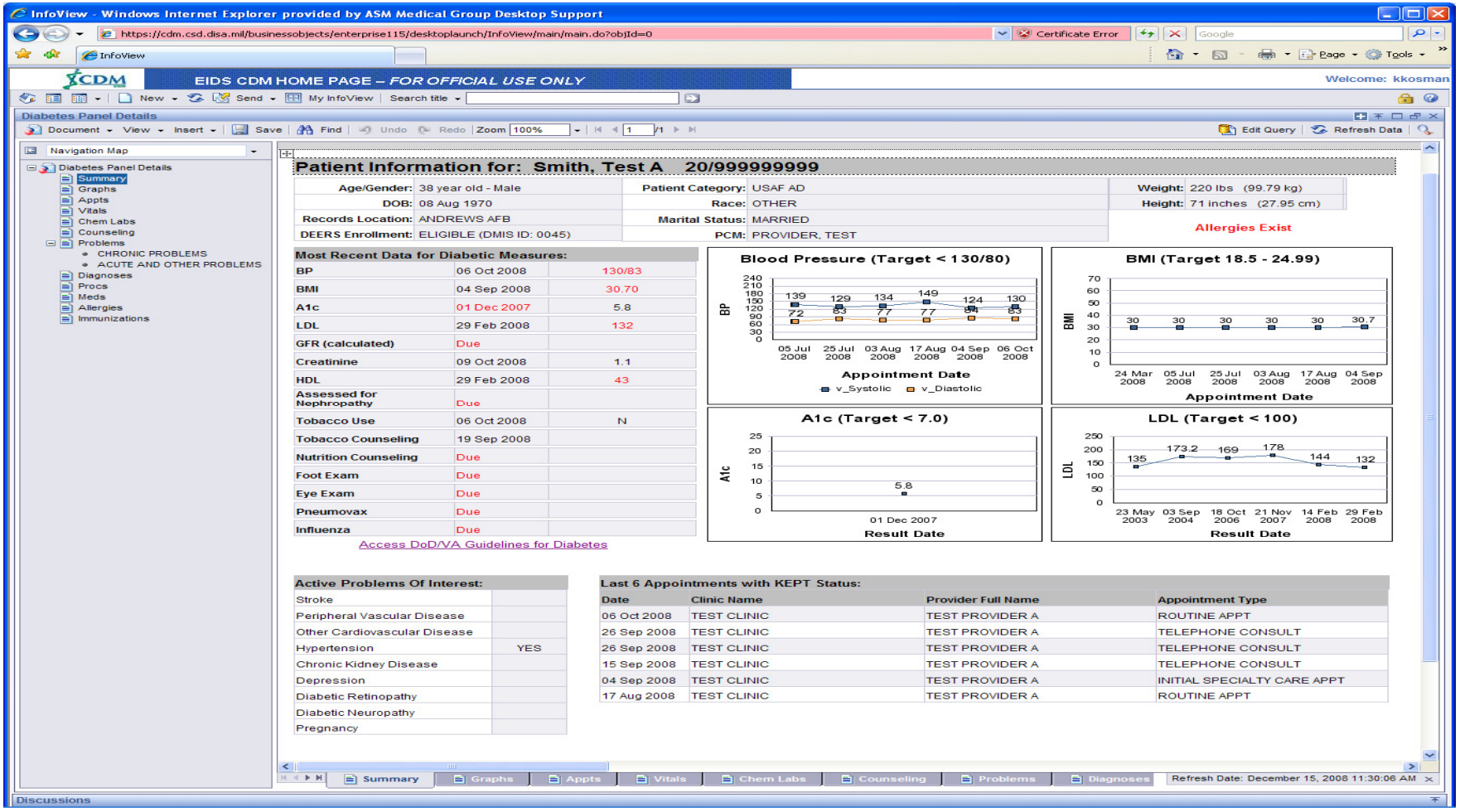
- ✓Population and preventive health experts
- ✓Providers
- ✓Nurses
- ✓Researchers
- ✓Clinical support staff
- ✓Data analysts
- ✓Clinic administrators

CDM Successes

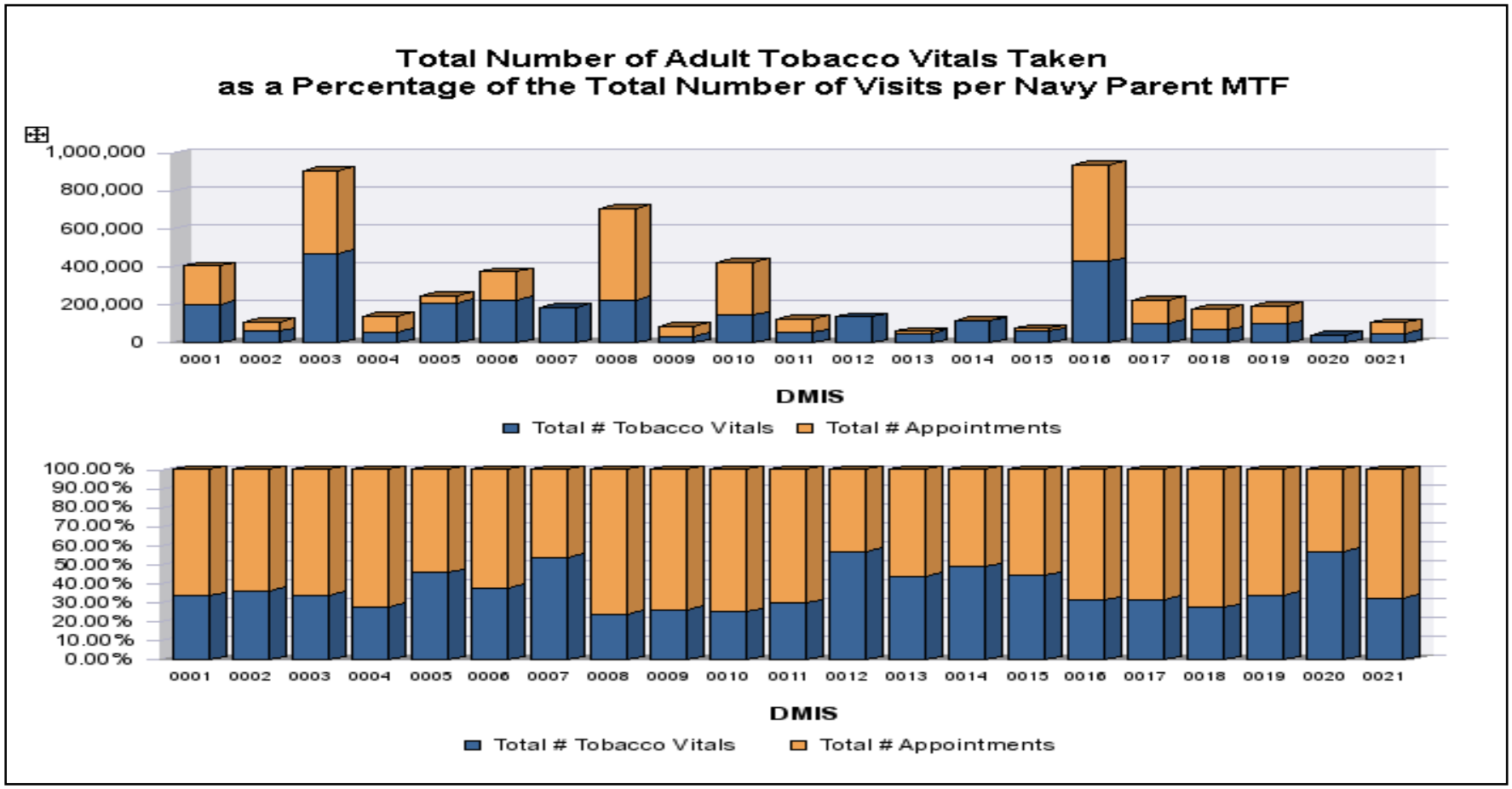
Army	Navy	Air Force
✓ Ensured vaccine compliance in high risk groups ✓ Improved effectiveness of smoking cessation ✓ Identified undiagnosed patients at risk for chronic kidney disease	✓ Enabled notification to patients at risk from vaccine recall in **hours** vs. **weeks** ✓ Sparked generation of disease management reports	✓ Improved clinical documentation ✓ Tracked medical readiness ✓ Delivered surgical outcomes analysis

Sample CDM Reports

Diabetes Provider Panel



Adult Tobacco Vitals

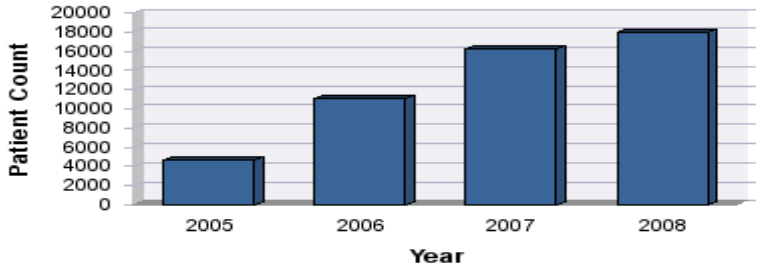


Post Traumatic Stress Disorder

Posttraumatic stress disorder (ICD9 309.81) Enterprise-wide *Two diagnoses required

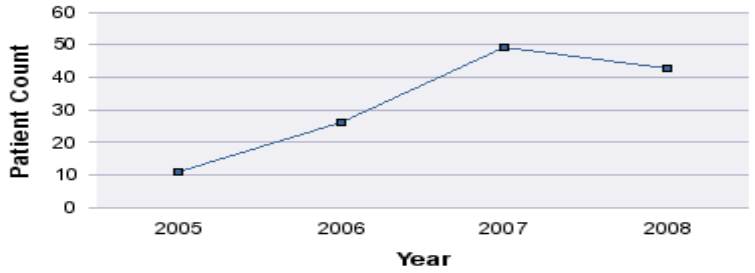
PTSD

Count of distinct patients diagnosed with PTSD.



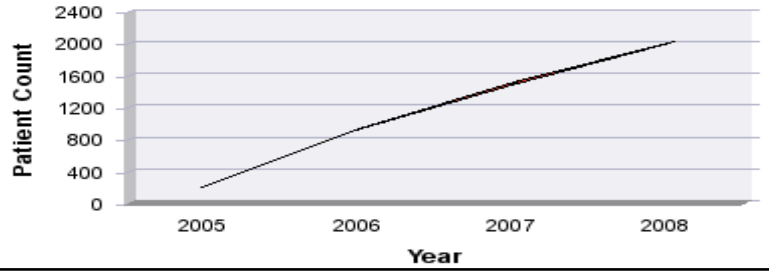
Suicide

Count of distinct patients diagnosed with PTSD and having a suicide attempt (ICD9 code: E950.* to E959.*).



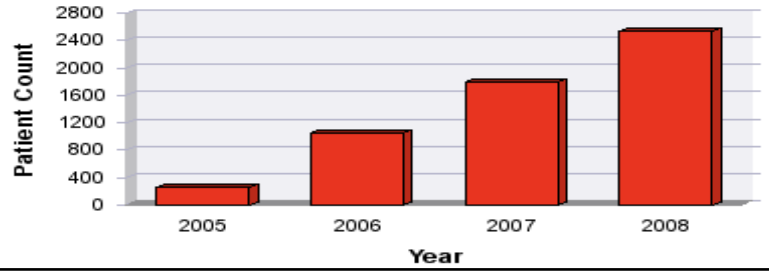
Alcohol

Count of distinct patients diagnosed with PTSD and reporting habitual alcohol use.



Tobacco

Count of distinct patients diagnosed with PTSD and reporting tobacco use.



PTSD findings based on single diagnosis / example of correlating phenomenon

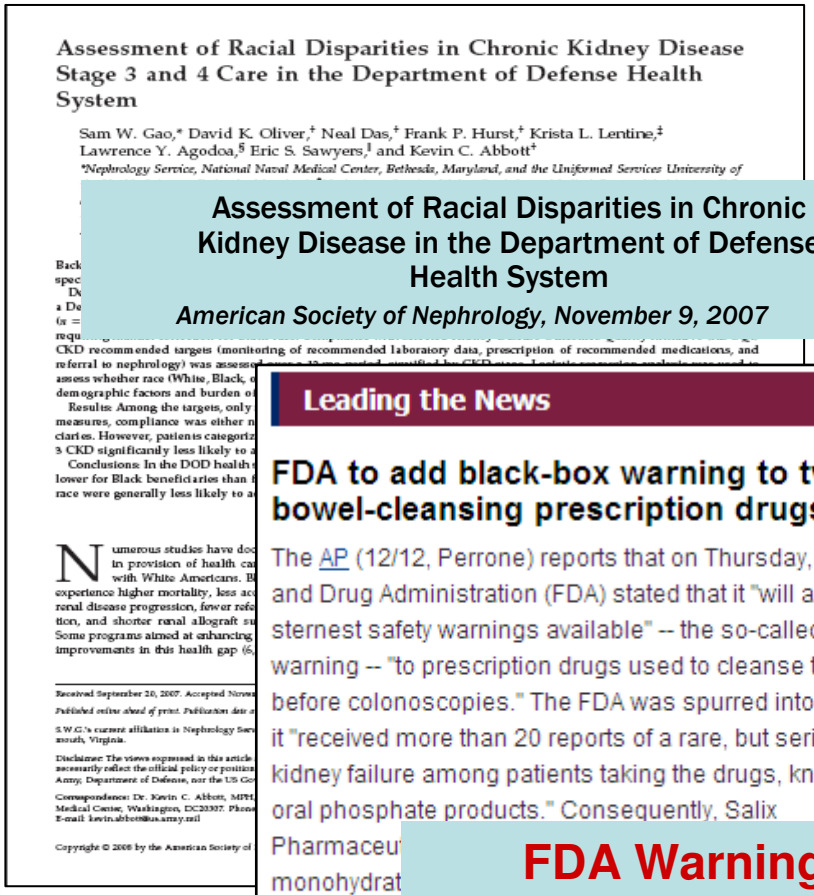
The Value of CDM

Automated Reporting of Undiagnosed Chronic Kidney Disease

Safety is Key

- Unrecognized chronic kidney disease a major risk factor
- Patients with undiagnosed chronic kidney disease can be inadvertently harmed
- Failure to take appropriate precautions puts patients, providers, and institutions at risk

Published Data on the Dangers of Undiagnosed Chronic Kidney Disease



Assessment of Racial Disparities in Chronic Kidney Disease Stage 3 and 4 Care in the Department of Defense Health System

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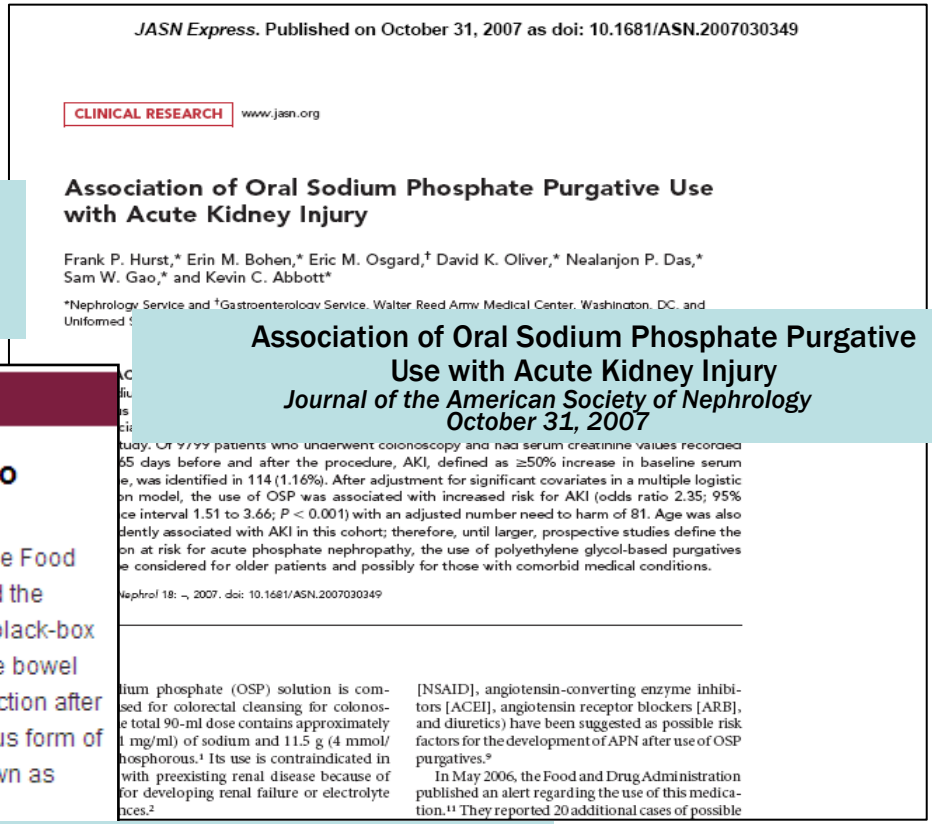
Assessment of Racial Disparities in Chronic Kidney Disease in the Department of Defense Health System

American Society of Nephrology, November 9, 2007



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CLINICAL RESEARCH www.jasn.org

Association of Oral Sodium Phosphate Purgative Use with Acute Kidney Injury

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Association of Oral Sodium Phosphate Purgative Use with Acute Kidney Injury

Journal of the American Society of Nephrology
October 31, 2007

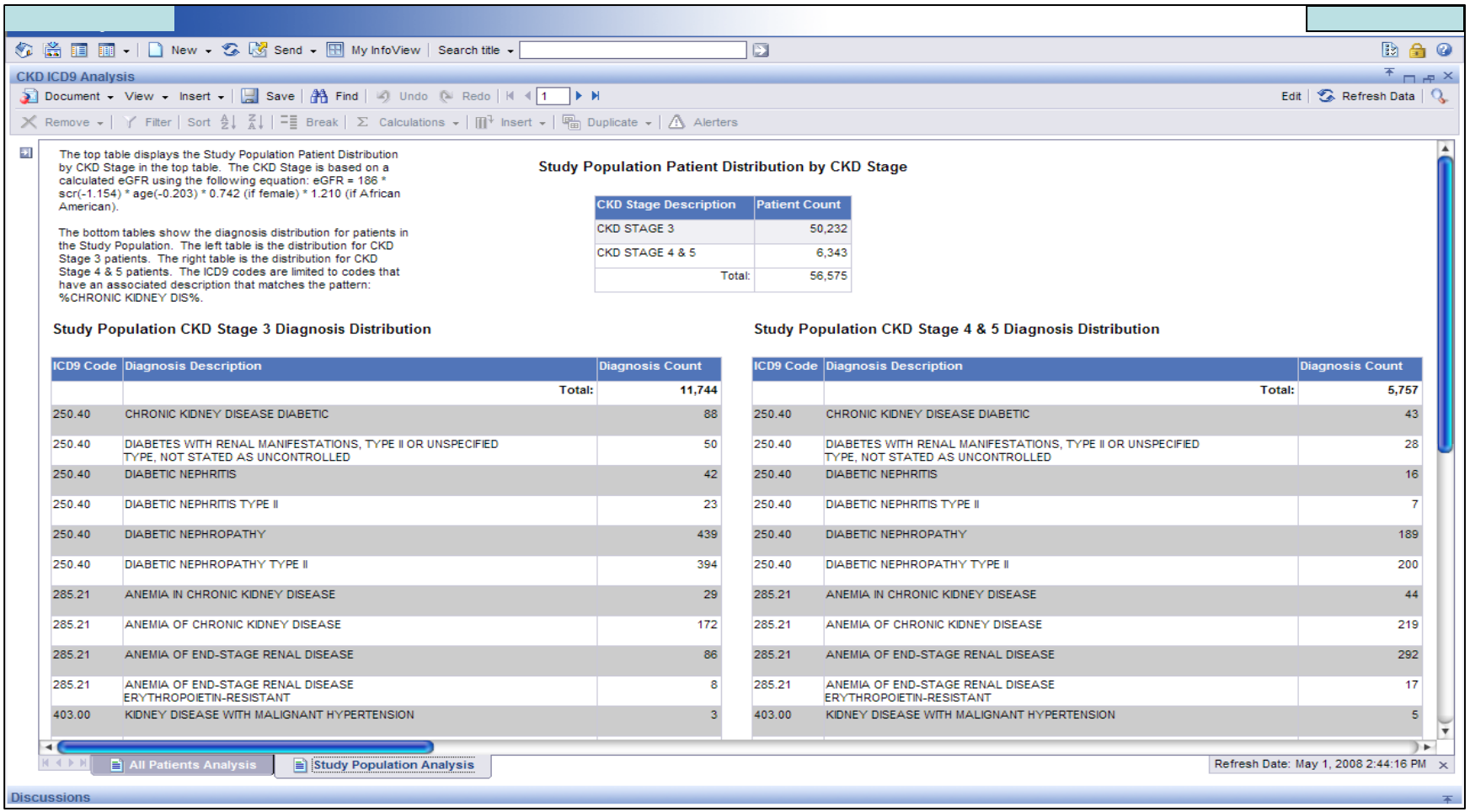
Leading the News

FDA to add black-box warning to two bowel-cleansing prescription drugs.

The AP (12/12, Perrone) reports that on Thursday, the Food and Drug Administration (FDA) stated that it "will add the sternest safety warnings available" -- the so-called black-box warning -- "to prescription drugs used to cleanse the bowel before colonoscopies." The FDA was spurred into action after it "received more than 20 reports of a rare, but serious form of kidney failure among patients taking the drugs, known as oral phosphate products." Consequently, Salix Pharmaceu monohydrat OsmoPrep (sodium biphosphate, sodium phosphate) will now include a label that "warns that the drugs should be used with caution in older patients, those that suffer from

FDA Warning December 12, 2008

CDM Patient Distribution by Chronic Kidney Disease Stage



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CKD ICD9 Analysis

Document | View | Insert | Save | Find | Undo | Redo | 1 | Edit | Refresh Data

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The top table displays the Study Population Patient Distribution by CKD Stage in the top table. The CKD Stage is based on a calculated eGFR using the following equation: eGFR = 186 * scr(-1.154) * age(-0.203) * 0.742 (if female) * 1.210 (if African American).

The bottom tables show the diagnosis distribution for patients in the Study Population. The left table is the distribution for CKD Stage 3 patients. The right table is the distribution for CKD Stage 4 & 5 patients. The ICD9 codes are limited to codes that have an associated description that matches the pattern: %CHRONIC KIDNEY DIS%.

Study Population Patient Distribution by CKD Stage

CKD Stage Description	Patient Count
CKD STAGE 3	50,232
CKD STAGE 4 & 5	6,343
Total:	56,575

Study Population CKD Stage 3 Diagnosis Distribution

ICD9 Code	Diagnosis Description	Diagnosis Count
	Total:	11,744
250.40	CHRONIC KIDNEY DISEASE DIABETIC	88
250.40	DIABETES WITH RENAL MANIFESTATIONS, TYPE II OR UNSPECIFIED TYPE, NOT STATED AS UNCONTROLLED	50
250.40	DIABETIC NEPHRITIS	42
250.40	DIABETIC NEPHRITIS TYPE II	23
250.40	DIABETIC NEPHROPATHY	439
250.40	DIABETIC NEPHROPATHY TYPE II	394
285.21	ANEMIA IN CHRONIC KIDNEY DISEASE	29
285.21	ANEMIA OF CHRONIC KIDNEY DISEASE	172
285.21	ANEMIA OF END-STAGE RENAL DISEASE	86
285.21	ANEMIA OF END-STAGE RENAL DISEASE ERYTHROPOIETIN-RESISTANT	8
403.00	KIDNEY DISEASE WITH MALIGNANT HYPERTENSION	3

Study Population CKD Stage 4 & 5 Diagnosis Distribution

ICD9 Code	Diagnosis Description	Diagnosis Count
	Total:	5,757
250.40	CHRONIC KIDNEY DISEASE DIABETIC	43
250.40	DIABETES WITH RENAL MANIFESTATIONS, TYPE II OR UNSPECIFIED TYPE, NOT STATED AS UNCONTROLLED	28
250.40	DIABETIC NEPHRITIS	16
250.40	DIABETIC NEPHRITIS TYPE II	7
250.40	DIABETIC NEPHROPATHY	189
250.40	DIABETIC NEPHROPATHY TYPE II	200
285.21	ANEMIA IN CHRONIC KIDNEY DISEASE	44
285.21	ANEMIA OF CHRONIC KIDNEY DISEASE	219
285.21	ANEMIA OF END-STAGE RENAL DISEASE	292
285.21	ANEMIA OF END-STAGE RENAL DISEASE ERYTHROPOIETIN-RESISTANT	17
403.00	KIDNEY DISEASE WITH MALIGNANT HYPERTENSION	5

All Patients Analysis | Study Population Analysis

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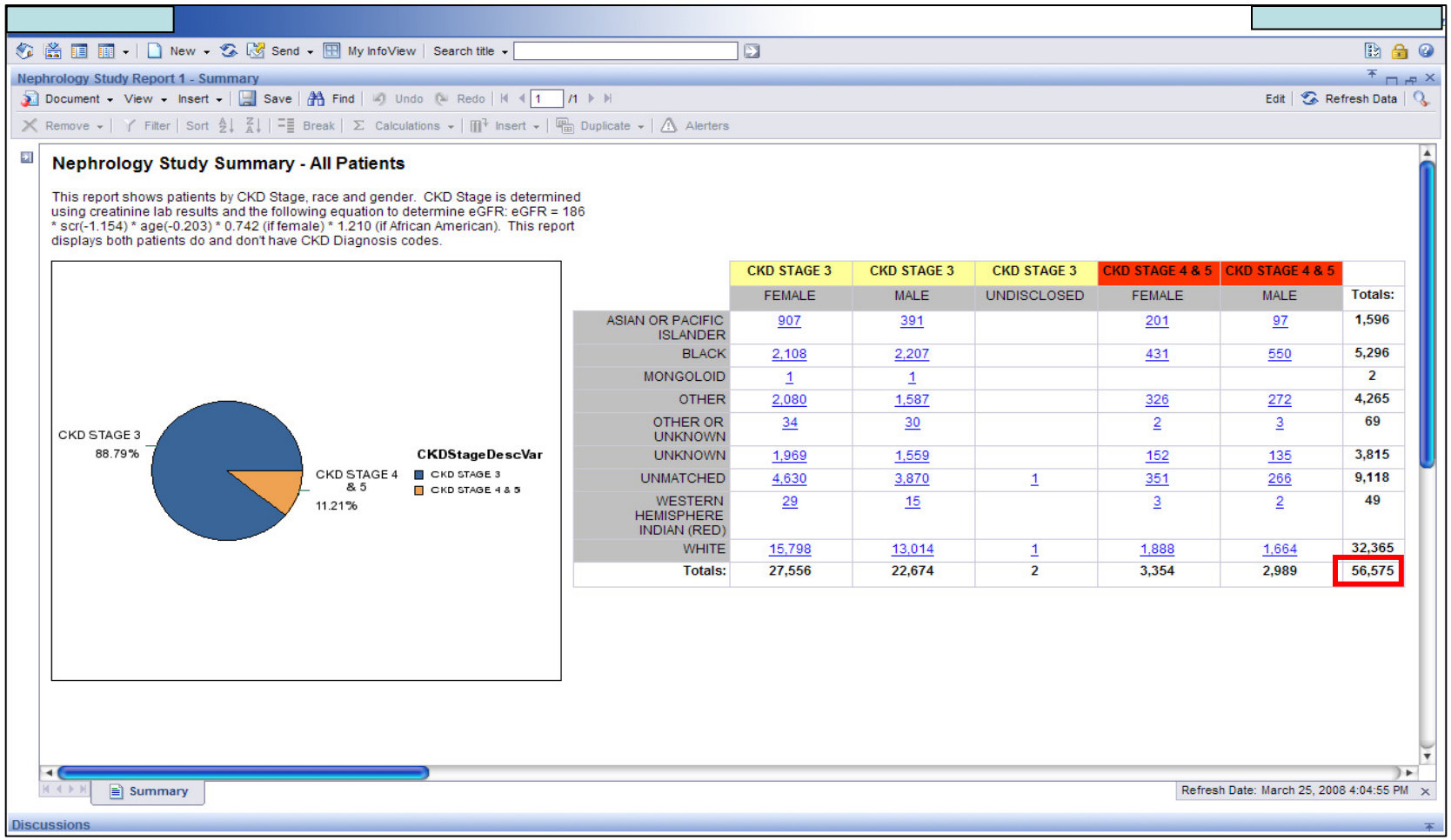
Discussions

Nephrology Study All Patients



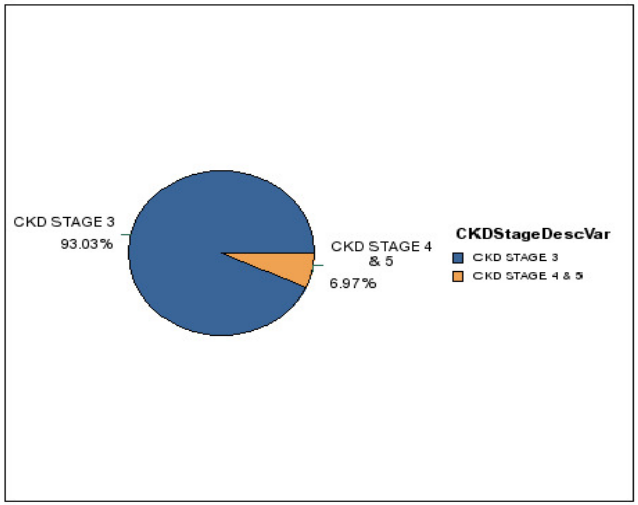
	CKD STAGE 3 FEMALE	CKD STAGE 3 MALE	CKD STAGE 3 UNDISCLOSED	CKD STAGE 4 & 5 FEMALE	CKD STAGE 4 & 5 MALE	Totals:
ASIAN OR PACIFIC ISLANDER	907	391		201	97	1,596
BLACK	2,108	2,207		431	550	5,296
MONGOLOID	1	1				2
OTHER	2,080	1,587		326	272	4,265
OTHER OR UNKNOWN	34	30		2	3	69
UNKNOWN	1,969	1,559		152	135	3,815
UNMATCHED	4,630	3,870	1	351	266	9,118
WESTERN HEMISPHERE INDIAN (RED)	29	15		3	2	49
WHITE	15,798	13,014	1	1,888	1,664	32,365
Totals:	27,556	22,674	2	3,354	2,989	56,575

Undiagnosed Patients At Risk

Undiagnosed CKD Patients - Summary

Nephrology Study Summary - Undiagnosed Patients

This report shows patients by CKD Stage, race and gender. CKD Stage is determined using creatinine lab results and the following equation to determine eGFR: eGFR = 186 * scr(-1.154) * age(-0.203) * 0.742 (if female) * 1.210 (if African American). This report displays only patients that don't have CKD Diagnosis codes.



	CKD STAGE 3 FEMALE	CKD STAGE 3 MALE	CKD STAGE 3 UNDISCLOSED	CKD STAGE 4 & 5 FEMALE	CKD STAGE 4 & 5 MALE	Totals:
ASIAN OR PACIFIC ISLANDER	734	294		101	46	1,175
BLACK	1,597	1,252		171	224	3,244
MONGOLOID	1	1				2
OTHER	1,764	1,177		149	122	3,212
OTHER OR UNKNOWN	33	24		2	2	61
UNKNOWN	1,816	1,278		78	88	3,260
UNMATCHED	4,286	3,264	1	205	181	7,937
WESTERN HEMISPHERE INDIAN (RED)	24	10		2	1	37
WHITE	13,979	10,008	1	976	764	25,728
Totals:	**24,234**	**17,308**	**2**	**1,684**	**1,428**	**44,656**

78.9% Undiagnosed
More than 44,000 patients

Summary

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Discussions

CDM Data Reporting Worldwide

- Automated clinical mining of electronic health record data is vital to identifying clinical quality indicators
- Clinical reporting is merely one tool of many required to measure, analyze, and manage direct patient care
- Rapidly reporting secure, actionable clinical data is priceless

For More Information

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